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Spathularia nigripes and *Trichoglossum walteri* newly recorded from Turkey

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ABSTRACT—Two ascomycetous species, *Spathularia nigripes (Cudoniaceae)* and *Trichoglossum walteri (Geoglossaceae),* are reported as new records for the Turkish mycobiota, based on collections from İstanbul and Konya provinces. Descriptions of the newly recorded species are accompanied by color photographs illustrating their macroscopic and microscopic features.

KEY WORDS—biodiversity, earth tongue, new record, taxonomy

Introduction

Ascomycetous macrofungi producing large pileate tongue-shaped fruiting bodies within several genera are generally referred to as earth-tongues. They are widely distributed and grow on various substrates. *Spathularia* Pers. and *Trichoglossum* Boud. are among these genera.

Spathularia (*Cudoniaceae*) is represented by 12 species (Kirk & al. 2008) that are generally characterized by fleshy, spathulate and stipitate ascocarps, clavate asci, filiform paraphyses, one-celled to septate ascospores; some species also produce obovoid to subgloboid conidia.

Trichoglossum (*Geoglossaceae)* is generally characterized by club-shaped brownish black apothecia, smooth or velvety stipes, 4–8-spored inoperculate asci with amyloid apical pores, apically curved or coiled septate paraphyses, and multiply septate ascospores.

Seven geoglossoid or cudonioid fungi taxa have been recorded from Turkey: *Cudonia circinans* (Pers.) Fr., *Geoglossum lineare* Hakelier, *G. umbratile* Sacc., *Trichoglossum hirsutum* (Pers.) Boud., *T. variabile* (E.J. Durand) Nannf., *Spathularia flavida* Pers. and *Spathulariopsis velutipes* (Cooke & Farl.) Maas Geest. (Akata & Kaya 2013; Güngör & al. 2015a,b), but the current checklists (Sesli & Denchev 2014, Solak & al. 2015) and the most recent Turkish mycobiota (Kaya & al. 2016; Işık & Türkekul 2018; Kaya & Uzun 2018; Sesli & al. 2018; Sadullahoğlu & Demirel 2018; Uzun & al. 2018; Acar & al. 2019; Akçay 2019; Keleş 2019; Uzun & Kaya 2019a,b) do not cite *Spathularia nigripes* and *Trichoglossum walteri* from the country. This work contributes new records to the mycobiota of Turkey.

Materials & methods

During 2017–2018, ascocarps were collected from Ereğli district (Konya province) and Şile district (İstanbul province). Observations on the morphology and ecology were noted in the field and the fruitbodies were photographed in their natural habitats prior to transfer to the laboratory for further research. Tissues were mounted in Congo Red and Melzer's reagent and examined under a Nikon Eclipse Ci-S trinocular light microscope. The samples were identified with the help of the relevant literature (Mains 1954, Geesteranus 1965, Cacialli & al. 1992, Vidal 1994, Fernández Vicente & Undagoitia 2004, Sandras & Hairaud 2007, Bessette & al. 2007, Placido Iglesias 2007, Requejo 2010, Ribes & al. 2015). IndexFungorum (2019) was followed for the systematics of the taxa. The specimens are kept at Karamanoğlu Mehmetbey University, Kamil Özdağ Science Faculty, Department of Biology, Turkey (KMU).

Taxonomy

Spathularia nigripes (Quél.) Sacc. Syll. Fung. 8: 49 (1889) FIG. 1

APOTHECIA ≤32 × 7 mm, spathulate to claviform, composed of a fertile head and a stipe. The fertile head 6.5–11.5 × 4–7 mm, ellipsoid, ovoid, somewhat squashed or flattened, longitudinally furrowed, sometimes wavy, glabrous, dirty white to beige. STIPE 7–20.5 × 2.5–3.7 mm, cylindrical, slightly thickened at the base, smooth or slightly furfuraceous, dark grey to brownish-grey or bluish-grey. Excipular cells have a prismatic texture in both fertile head and stipe. ASCI 101–135 × 9–13 (14.5) µm, claviform, inoperculate, inamyloid, generally 8-spored, arising from croziers. PARAPHYSES filiform, hyaline, septate, with curved, twisted, or spiral apex, some bifurcated near the apex. ASCOSPORES 38–42 × 2–2.6 µm, needle-shaped, hyaline, smooth, some septate, with small, scattered drops, heteropolar, acute at one end while obtuse at the other. SECONDARY SPORES (conidia) originating from mature ejected ascospores, 2.2–2.4 × 2–2.2 µm, subglobose and attached to the ascospores by a thin sterigma.

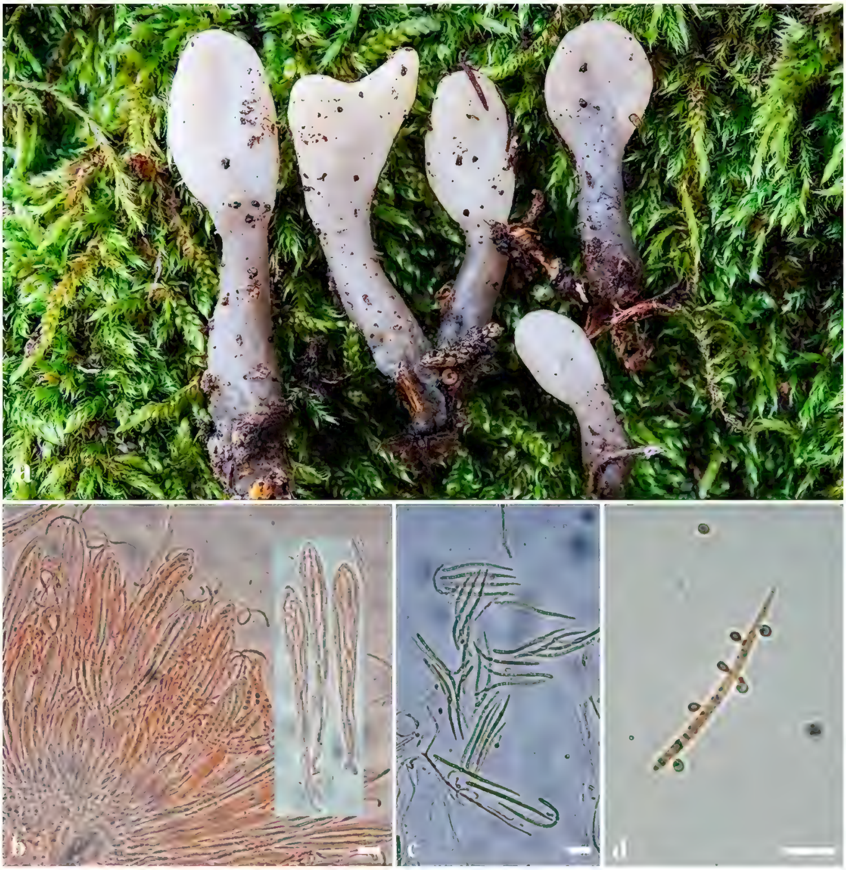

Fig 1. *Spathularia nigripes* (KMU–Uzun 6290): a. ascocarps; b. asci and paraphyses (Congo red); c. ascospores (Melzer); d. secondary spores (conidia) developing from ascospores (Congo red). Scale bars = 10 µm.

Specimen examined—**TURKEY, Istanbul: Şile,** Sofular Village, 41°09′N 29°30′E, 105 m, broad leaved forest, on decaying stump of *Laurus nobilis* L. (*Lauraceae*), 07.03.2018, Y. Uzun 6290 (KMU).

Comments—The Turkish collection of *Spathularia nigripes* matches literature descriptions. *Spathularia* species generally resemble each other. *Spathularia flavida* is separated from *S. nigripes* by its larger (≤80 mm) carpophores and flattened, compressed or lobed fertile zone (Breitenbach and Kränzlin 1984, Cacialli & al. 1992). The longer ascospores of *S. flavida* (≤70 µm) are another distinguishing character (Ribes & al. 2015).

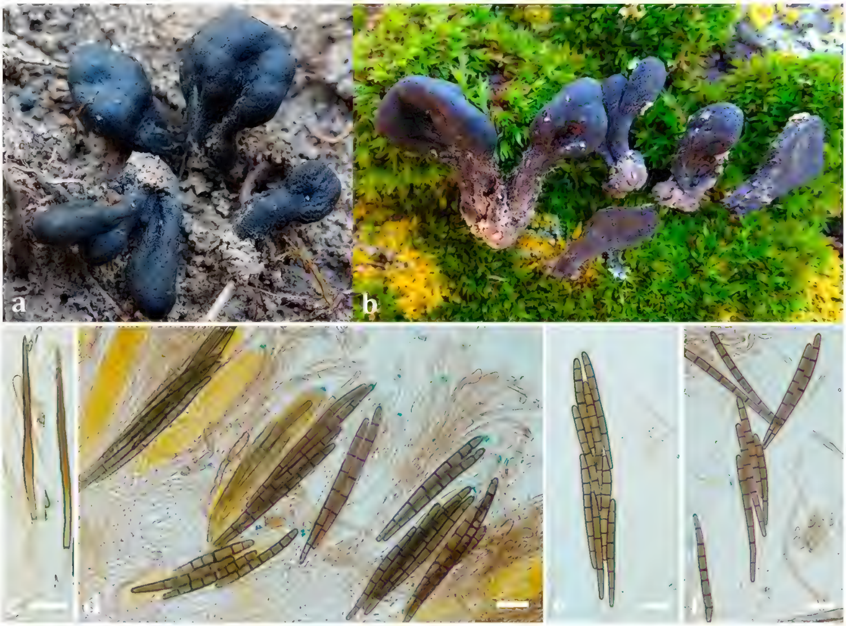

FIG 1. *Trichoglossum walteri* (KMU–Uzun 6019): a,b. ascocarps; c. hairs; d. asci, paraphyses and ascospores; e,f. ascospores (all in Melzer). Scale bars = 20 µm.

Spathularia nigripes is known to occur on small remnants of unidentified wood in mixed forest of *Pinus canariensis* C. Sm. and *Eucalyptus,* and in fayal-heath (*Erica* L., *Ilex* L., *Laurus* and *Myrica* L. spp.) in Spain (Ribes & al. 2015), among *Erica arborea* L. wood remnants in Greece (Mycohellas 2019) and on sandy soil among woody debris in mixed forest in Italy (Cacialli & al. 1992).

Trichoglossum walteri (Berk.) E.J. Durand, Ann. Mycol. 6: 440 (1908) FIG. 2

ASCOCARPS 30–80 mm long and 5–7 mm thick, spathulate to ligulate, with a median groove and obtuse apex, black to brownish black, densely setose. STIPE 3–6 mm thick, setose, concolorous with the ascogenous portion. ASCI 150–220 × 14–19 µm, cylindrical to somewhat clavate, 8-spored, apical pore becoming blue in Melzer's solution. PARAPHYSES septate, generally curved and thickened at the apex ≤8 µm. ASCOSPORES (70–)80–110(–120) × 5–6.5 µm, subcylindrical to fusiform, narrower below, generally with 7–8 septa, some 4-septate or aseptate when immature, brown to blackish brown. HYMENIAL SETAE 90–130 × 6–9 µm, thick-walled, straight, not forked, dark-brown to black-brown.

Specimen examined—**TURKEY, Konya: Ereğli,** Taşağıl Village, 37°30′N 33°5′E, 1015 m, on soil under *Salix* and *Populus* near a puddle, 09.12.2017, Y. Uzun 6019 (KMU).

Comments—*Trichoglossum walteri* is morphologically similar to *T. hirsutum, T. octopartitum* Mains, and *T. variabile.* The ascospores of *T. hirsutum* and *T. variabile* are slightly longer and have more septa (9–15). The spores of *Trichoglossum octopartitum* are, like those of *T. walteri,* 7-septate but longer (101–125(–138) (Kučera & al. 2010).

Mains (1954) reports *T. walteri* on soil and rotting wood in North America, while Placido Iglesias (2007) collected it in wet mossy soil areas in Spain.

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